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FOREST INSECT INVESTIGATIONS

BARK BEETLES ACTIVE FOLLOWING TILLAMOOK FIRE

By
R. L. Furniss
Junior Forester

Forest Insect Laboratory
Portland, Oregon
Nov. 29, 1935

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AND PLANT QUARANTINE

Forest Insect Laboratory,
445 U.S.Court House,
Portland, Oregon.
Nov. 29, 1935.

Dr. F. C. Craighead,

Washington, D. C.

Dear Dr. Craighead:

Enclosed is a manuscript prepared by Mr. Furniss concerning the recent widespread flare-up of Douglas fir beetle activity in the vicinity of the Tillamook burn. Since this has aroused the anxiety of the timber owners in this region, we thought that an article from us as to the probable outcome would be timely and help to answer some of the many questions. This news note, if approved, would be submitted to the Timberman for publication.

In accordance with custom, I am sending copies to the other field stations for their review and comments.

Very sincerely yours,

F. P. Keen,
Entomologist.
Forest Insect Investigations.

cc Miller
Evenden
Beal

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BARK BEETLES ACTIVE FOLLOWING TILLAMOOK FIRE

By
R. L. Furniss
Junior Forester
Forest Insect Investigations
U. S. Bureau of Entomology and Plant Quarantine

The recent appearance of large groups of dying Douglas fir in and around the area covered by the great Tillamook fire of 1933 is causing considerable apprehension to the owners of timberlands in that section of western Oregon. They are particularly fearful that this killing, not only of scorched but of green timber, may spread and gradually involve a high percentage of the green stands or develop a situation in fir similar to that prevailing in ponderosa pine, where millions of feet of timber are being killed every year by bark beetles. According to all reports of timbermen and local residents, this is a most unusual condition and quite without precedent in their experience.

Observations made in the summer of 1935 to determine the cause of this killing showed it to be due to the work of the Douglas fir beetle (Dendroctonus pseudotsugae Hopk.). This small, reddish-brown, hard-shelled bark beetle, about one-fourth of an inch in length, belongs to a group of very destructive tree killing beetles. The adults of the Douglas fir beetle select a tree and attack it in numbers. Each pair of beetles bores into and under the bark. Upon reaching the wood surface, they construct one nearly straight, vertical egg gallery several inches in length, and along the sides of this gallery the female deposits a number of eggs. These hatch into small white grubs, or larvae, which bore out at right angles to the egg

gallery, forming a characteristic double fan-shaped design on the inner bark and wood surfaces which can be seen by removing a section of bark from an infested tree. The grubs increase in size until they are about one-fourth of an inch long. These fully grown larvae construct small cells in the bark in which they transform, first into white, fragile, non-feeding forms known as pupae, and then into new adults. The attacks are usually made in the spring or summer, and the entire cycle usually takes about one year. The egg tunnels and the mines of the grubs girdle the attacked trees and shut off the sap flow, thus causing their death. The work of these beetles not only kills the trees but loosens the bark and introduces blue stain and decay spores which start the processes of wood deterioration.

The Douglas fir beetle is a native insect associated with Douglas fir throughout the natural range of this tree. In Douglas fir forests east of the Cascade range, in the Inland Empire, and the Northern Rocky Mountain region, it is frequently an aggressive tree killer like its near relatives in pine. But in the Douglas fir region of western Oregon and Washington, it normally attacks and breeds only in injured, weakened or fire-killed trees. However, at times, even in this region, there have been instances of loss caused by this beetle, especially in areas adjacent to logging operations or burns. Such infestations usually have subsided within a short time.

While it is unusual to find severe bark beetle damage in the Douglas fir region of western Oregon and Washington, it is not surprising under the present circumstances. From 1929 to 1933, a yearly succession of large fires in the Tillamook area made available to the Douglas fir beetle a vast amount of favorable breeding material. As

a result, the beetle population increased greatly until the spring of 1935, when it is probable that a majority of the Douglas fir killed by the Tillamook fire contained beetle broods. In the spring of 1935, countless adult beetles emerged to find very little favorable host material in the form of fire-killed trees. Some of the beetles were absorbed by fire-scorched trees adjacent to the burn; others flew out into the main body of green timber, often many miles from the burn, and attacked groups of healthy trees. These beetle-attacked trees are visible at the present time either as borders of red trees around the burn, or as red spots in the green timber. From one lookout, Mt. Hebo on the Siuslaw National Forest, it is possible to see more than fifty groups of infested trees in the main body of green timber. These groups vary in size from small spots of a few trees to areas of two or three acres.

This type of damage appears to be general around the borders of the Tillamook burn, the Cochran burn and other burns in that vicinity. Reports of dying trees have been received from the Flora Logging Company at Carlton, the Consolidated Timber Company at Glenwood, from the Wheeler Logging Company near Cochran, Oregon, and from members of the Coast Counties Fire Patrol Association. Extensive killings have occurred in five Oregon Counties: namely, Clatsop, Tillamook, Columbia, Washington, and Yamhill. Losses are more noticeable on the eastern side of the Tillamook burn than on the western, but some activity is present on all sides and in the islands of green timber within the burn.

Considering the normal habits of the Douglas fir beetle and its previous history as a relatively non-aggressive enemy of Douglas

fir in this region, it is believed that the present outbreaks will gradually subside. Because it usually does not breed in trees that have been dead more than one year, the enormous supply of breeding material furnished by the fires of 1933 is no longer suitable for its activities. No new material has become available to maintain the abnormally high beetle population, since no large fire has occurred in the Tillamook area in the last two years. Nor does this beetle appear to be capable of maintaining aggressive attacks when its activities are confined to the fast growing, vigorous Douglas firs in this region. For these reasons it appears unlikely that the present damage will increase or even maintain its present rate for more than a season or two. The chances are that the present flare-up will drop out of sight by another year.

While control methods, consisting of felling, barking or burning infested trees, have been successfully used in some cases, they do not appear to be feasible under the present circumstances. There is probably nothing economically justifiable which can be done to hasten the natural decline. About all that the timber owners can do is to salvage the killed trees as rapidly as possible, preferably within a five-year period before the loss from deterioration has become excessive.